

Plan for Field Tryout of Assessment Packages

J. Ward Keesling

BDM Federal, Inc.

19960919 016

<p>This report is published to meet legal and contractual requirements and may not meet ARI's scientific or professional standards for publication.</p>

August 1996


United States Army Research Institute for the Behavioral and Social Sciences

Approved for public release; distribution is unlimited

U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES

A Field Operating Agency Under the Jurisdiction
of the Deputy Chief of Staff for Personnel

EDGAR M. JOHNSON
Director



NOTICES

DISTRIBUTION: This report has been cleared for release to the Defense Technical Information Center (DTIC) to comply with regulatory requirements. It has been given no primary distribution other than to DTIC and will be available only through DTIC or the National Technical Information Service (NTIS).

FINAL DISPOSITION: This report may be destroyed when it is no longer needed. Please do not return it to the U.S. Army Research Institute for the Behavioral and Social Sciences.

NOTE: The views, opinions and findings in this report are those of the author(s) and should not be construed as an official Department of the Army position, policy, or decision, unless so designated by other authorized documents.

REPORT DOCUMENTATION PAGE

Form Approved
OMB No. 0704-0188

Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188), Washington DC 20503.

1. AGENCY USE ONLY (Leave blank)		2. REPORT DATE August 1996	3. REPORT TYPE AND DATES COVERED Final Report 06/30/93 - 04/15/95	
4. TITLE AND SUBTITLE Plan for Field Tryout of Assessment Packages			5. FUNDING NUMBERS MDA903-92-D-0075-0017 2126 R09 623007 A794	
6. AUTHOR(S) Dr. J. Ward Keesling				
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) BDM FEDERAL INC. DOD CENTER MONTEREY BAY 400 GIGLING ROAD SEASIDE, CA 93955			8. PERFORMING ORGANIZATION REPORT NUMBER	
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES) U.S. ARMY RESEARCH INSTITUTE FOR THE BEHAVIORAL AND SOCIAL SCIENCES 5001 EISENHOWER AVENUE ALEXANDRIA, VA 22333-5600			10. SPONSORING/MONITORING AGENCY REPORT NUMBER Contractor Report 96-60	
11. SUPPLEMENTARY NOTES The COR is Michael R. McCluskey. This report is published to meet legal and contractual requirements and may not meet ARI's scientific or professional standards for publication.				
12a. DISTRIBUTION/AVAILABILITY STATEMENT APPROVED FOR PUBLIC RELEASE; DISTRIBUTION IS UNLIMITED.			12b. DISTRIBUTION CODE	
13. ABSTRACT (Maximum 200 words) The purpose of this document is to present a plan to provide field validation trials of the CCF Assessment Packages. A preliminary review that should focus on the degree to which the assessment packages reflect current Army doctrine is also suggested. The field trials should focus on practical problems in implementing the assessment packages at CTCs, major simulation centers, and home stations. The first section of this document briefly describes the structure and content of the CCF Assessment Packages. The next section describes the plan for review and field trials. The CCF Assessment Packages have been prepared to complement a function-oriented training program at home stations. These packages may be useful for assessing unit performance in simulated combat at the CTCs and other simulation centers. Before they are adopted widely they should be reviewed for doctrinal content (with some attention paid to areas that are in flux and likely to change soon), and for practicality of application in the settings for which they are intended. Field trials in these settings provide the information needed to improve the utility of these packages.				
14. SUBJECT TERMS Integrated Program for Combined Arms Training (IPCAT), Training Management Cycle, Field Trials, (CTCs) Combat Training Centers, (AAR) After Action Review, (O/Cs) Observer/Controllers			15. NUMBER OF PAGES	
			16. PRICE CODE	
17. SECURITY CLASSIFICATION OF REPORT UNCLASSIFIED	18. SECURITY CLASSIFICATION OF THIS PAGE UNCLASSIFIED	19. SECURITY CLASSIFICATION OF ABSTRACT UNCLASSIFIED	20. LIMITATION OF ABSTRACT UNLIMITED	

PLAN FOR FIELD TRYOUT OF ASSESSMENT PACKAGES

Dr. J. Ward Keesling
PRC Inc.

Submitted by: Mr. Michael R. McCluskey, Acting Chief
Unit-Collective Training Research Unit
and Jack Hiller, Director
Training Research Laboratory

Michael R. McCluskey, Contracting Officer's Representative



May 3, 1995

U.S. Army Research Institute

**PLAN FOR FIELD VALIDATION TRIALS
OF CRITICAL COMBAT FUNCTION ASSESSMENT PACKAGES**

	page
I. Introduction	1
A. Background	1
B. Purpose	3
II. Content of the Assessment Packages	3
III. Plan For Review and Field Trial	6
A. Overview	6
B. Doctrinal Review	6
C. Home Station Field Trials	6
D. Field Trials at Simulation Centers	7
E. Field Trials at the Combat Training Centers	8
IV. Collection and Analysis of Feedback Data	10
V. Summary	10
VI. References	11

PLAN FOR FIELD VALIDATION TRIALS OF CRITICAL COMBAT FUNCTION ASSESSMENT PACKAGES

I. INTRODUCTION

A. Background

In 1992 the Army Research Institute initiated the development of an Integrated Program for Combined Arms Training based on an analysis of the functions performed by combat units. One motivation for basing training on a functional analysis was to move away from the traditional task-based model for collective training, toward a model based on functions performed on the battlefield. The idea was that such a training program would be robust against changes in the underlying doctrine, the supporting tactics, techniques and procedures, as well as changes to equipment. The Army had based some training guidance on the Battlefield Operating Systems (BOS), but these had been found to be too large in scale for effective management. On the other hand, the tasks in Army Mission Training Plans (MTPs) seemed to be too fine in scale. The Critical Combat Functions (CCFs) were first identified as BOS sub-functions, focusing on specific units or echelons that had to perform particular functions within a BOS. Eventually CCFs were defined as:

The integration of related participants and tasks that represent a source of combat power. The synchronization of critical combat functions provides commanders at any echelon with a definable outcome that materially affects the battle¹.

Of 39 Critical Combat Functions, 25 are directly related to the performance of missions by maneuver task forces and were selected for further development. A top-down front-end-analysis was conducted which resulted in several products, including:

- a statement of the purpose for each CCF,
- a list of outcomes that must be accomplished to achieve the purpose, and
- a consolidated list of tasks (drawn from many Army sources) required to achieve the outcomes.

These task lists were organized around the chronology of battle phases and the groupings of personnel who performed them. These task lists have been subjected to considerable internal (to the ARI contract team) and external review.

The Integrated Program for Combined Arms Training was to include guidance to assist commanders in the design of training events to allow personnel to practice their tasks. As this

¹ This definition is found in the Preface to each CCF Task Analysis. See, for example, McIlroy (1994).

development was being conceptualized, it became clear that a set of assessment packages would be useful to aid the commander in determining the status of his unit. Subsequently, ARI contracted with the team developing the CCFs to develop CCF-based assessment packages.

Although the assessment packages were developed to assist home station commanders with the management of training, another audience was also recognized: Observer/controllers at Combat Training Centers (CTCs) could use the assessment packages to make standardized appraisals of the performance of units. These two uses are discussed in more detail in the following.

Home station commanders use the Army's Training Management Cycle (FM 25-100), depicted in Figure 1, to manage unit training. The assessment packages developed in this study may be used in three ways as part of the Training Management Cycle:

1) They may serve as an aid to the commander who is trying to judge the status of his unit at the start of the training management cycle. A commander who had used the assessment packages in prior exercises would have the information needed to perform the assessment in accordance with FM 25-100. Using these packages to systematically record assessments would provide valuable information for a new commander when he assumes command.

2) They may serve as a guide for the information to be gathered during home station training exercises to determine whether the training has been effective in bringing a unit up to the level of proficiency the commander desires. The emphasis here is on diagnosing weaknesses in performance so that efficient and effective retraining activities may be developed. The assessment packages allow the diagnosis to identify the personnel and tasks most in need of retraining; thus, retraining activities can be focused to conserve resources and time.

3) By comparing unit performance to a prior baseline, the assessment packages could also be used to document particularly successful tactics, techniques and procedures that the unit may have developed, or to identify effective training activities.

The primary mission of the CTCs is to provide feedback to units about their performance under highly realistic and demanding conditions. The secondary mission is to provide information to the Army about the performance of units. Performing these missions effectively requires that the assessments of unit performance be standardized with respect to content and as free of subjective judgement as possible. The CCF-based assessment packages would help to assure that CTC assessments have these qualities in three ways:

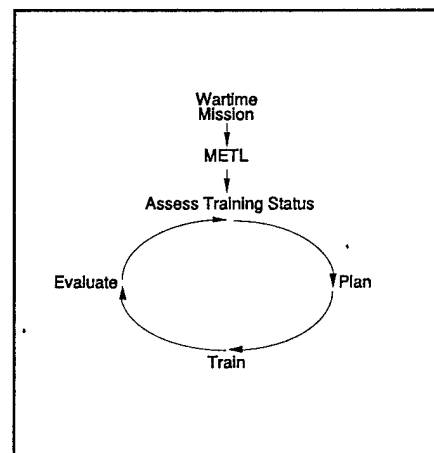


Figure 1. Training Management Cycle

1) They would help to standardize the assessments made at all CTCs by providing a common framework for observing performance and recording the assessments.

2) They could help to control for variations among OCs in assessing equivalent performances through their focus on observable facets of performance, thus reducing the subjective component.

3) They could be used as a basis for training the OCs to help standardize their assessments in terms of content and reliability (defined as between-OC agreement).

With respect to the primary mission of the CTCs, using the CCF-based assessment packages to standardize the information provided to the training units would allow those units to compare their self-assessments (typically made under less demanding conditions) to the CTC's assessments as a check on their understanding of what is required to accomplish a particular mission. The training units could then develop more effective training programs. The assessment packages could become a vehicle for the CTC OCs to use in mentoring their counterparts at home station, as suggested by the former Chief of Operations Group at NTC, BG J. O'Neal (1994).

The second mission of the CTCs is to provide information to the Army about the performance of units. The assessment packages could be used to identify particularly effective tactics, techniques and procedures employed by the training units. These could be distributed to the Army through the Lessons Learned publications. Using standardized assessments, gathered over time, the Army could evaluate the effects of changes to Army doctrine, organization, training, materiel, leadership, or soldier quality. Some analysis strategies that could be adapted to this purpose are described by Keesling and Clifton (1994).

B. Purpose

The purpose of this document is to present a plan to provide field validation trials of the CCF Assessment Packages. A preliminary review that should focus on the degree to which the assessment packages reflect current Army doctrine is also suggested. The field trials should focus on practical problems in implementing the assessment packages at CTCs, major simulation centers, and home stations. The first section of this document briefly describes the structure and content of the CCF Assessment Packages. The next section describes the plan for review and field trials.

II. CONTENT OF THE ASSESSMENT PACKAGES

The Assessment Packages have four major sections:

1. The statement of purpose. This is the purpose of the CCF, the end state that particular function is to achieve. The primary question that must be addressed after each mission is, "Did the unit achieve the purpose?" This section asks for a simple

yes or no response to this question. In addition, if the unit's performance was particularly excellent, this section provides a place for the observer to record the tactics, techniques and procedures the unit used for possible dissemination to other Army units.

2. Measures of effectiveness. This section of the assessment package contains tables and checklists that may be used to record objective -- sometimes quantitative -- measures of performance. These measures are oriented to events on the battlefield. Examples are the amount of time it takes to prepare an order, the number of fighting positions that are prepared to Army standard, or whether information was disseminated in a timely manner.
3. Assessment strategy. In most training exercises, particularly at home stations, there are barely sufficient numbers of observers who can monitor the activities. This section of the assessment package indicates when and where the observer is most likely to find the information needed to make a particular assessment. This section is a job aid for the personnel managing the exercise, allowing them to allocate observers to monitor the key locations, events, products and personnel.
4. Assessment and diagnosis. In this section of the assessment package each outcome is addressed in two subsections. The first asks for an overall assessment of the performance of the outcome. 'Assessment statements' are provided to orient the observer to observable performances related to the tasks underlying the outcome. The second subsection asks for a more detailed diagnosis of any problems in performance with respect to this outcome. In the diagnosis subsection, the most important tasks are given in more detail (called 'task elements') so that the observer may note those that are particularly deficient. (Or, highlight those that are exemplary to document a particularly effective tactic, technique or procedure.)

Table 1 shows the page describing the generic assessment scale that is incorporated in each of the assessment packages. Attempts to define specific behavioral anchors for each outcome assessment were not successful. The outcomes result from the integrated performance of many tasks. The tasks may vary in importance from mission to mission depending on the nature of the threat or the fortunes of war. It was not possible to describe each anchor point adequately without resort to artificial and arbitrary demarcations based on, for example, the percentage of tasks performed to standard. Statements of this nature might easily be misinterpreted as Army standards of performance, and this project was not intended to develop such standards. An important subsequent development of these packages will be the tailoring of the behavioral anchors to each outcome. An Army agency should define these behavioral anchors. For example, where Army standards have been established they could be used to define the 'Adequate' level of performance. The appropriate Army school(s) could promulgate these behavioral anchors. OCs from the CTCs might be able to provide suggestions (or review of proposed anchors) through the Center for Army Lessons Learned.

Table 1: Assessment Scale

The following scale is to be used whenever the unit's performance must be rated with respect to an outcome, or component of an outcome. Whenever these ratings are required, the outcome (or component) will be framed in a box with the rating scale, as in this example:

OUTCOME I: The TF Fire Support Plan
 integrates all indirect fire systems in support of the TF scheme of maneuver.

Adequate Marginal Not Adequate

In each case, circle the appropriate rating, using the scale below for guidance:

Adequate	Marginal	Not Adequate
↓	↓	↓
The unit can successfully accomplish the outcome to standard. Outcome is accomplished with no significant shortcomings.	The unit can successfully accomplish the outcome with some shortcomings.	The unit cannot accomplish the outcome to standard.

[It would be preferable to have statements defining these scale points that were tailored to each assessment. It is important that these be standardized, so an Army agency should define these behavioral anchors. For example, where Army standards have been established they could be used to define the 'Adequate' level of performance. The appropriate Army school(s) could promulgate these behavioral anchors. OCs from the CTCs might be able to provide suggestions (or review of proposed anchors) through the Center for Army Lessons Learned.]

Generally speaking, the assessment packages synopsise the tasks presented in the task analysis. The task analysis and training guidance package for each CCF present the tutorial information about how the CCF is laid out and how it connects to the other CCFs. The assessment packages focus on the principal tasks associated with each outcome of each CCF.

III. PLAN FOR REVIEW AND FIELD TRIAL

A. Overview

The following plan describes four coordinated approaches to evaluating the CCF Assessment Packages. The first approach addresses the need to be sure that the CCF Assessment Packages conform to current Army doctrine. The remaining approaches address the practicality of implementing the packages in various settings. Three settings are considered: CTCs, Home Stations and major simulation centers. The integration of these results is addressed in the last section.

B. Doctrinal Review

Although the CCF Task Analyses have undergone extensive peer review, they have not been systematically reviewed at the Army school(s) most responsible for the associated doctrine. A review of the Task Analysis and the Assessment Package associated with each CCF by a doctrinal specialist should validate the conformance of the Task Analysis with current doctrine and assure that the Assessment Package reflects the most salient tasks to be addressed in training. It would be particularly useful to have the Army schools develop behavioral anchors for ratings of each of the outcome assessments.

This review could occur prior to the field trials, or concurrently. The benefit of having the review occur first is that the materials fielded to the units and the CTCs would be revised to reflect the current doctrine. If the review is conducted concurrently with the field trials, then questions about doctrinal applicability raised in the field could not be answered until the review was completed.

C. Home Station Field Trials

The purpose of the home station field trials is to determine the practicality of the assessment packages. Typically home stations are short on observer/controller resources, especially in support of task force sized exercises. The commander will have to allocate his observer resources to gather the most useful information about unit performance. Home stations also implement a training cycle which starts with training smaller elements on fundamental skills and progresses to train larger aggregates of smaller units on increasingly complex tasks. An entire task force or brigade participates in a limited number of exercises. The commander will

have to identify the sections of the assessment packages that are most relevant to the training at each stage of this process. The questions to be answered by these field trials include:

- Can the commander use the assessment packages as the basis for gathering the information he needs throughout the FM 25-100 training management cycle?
- Can the commander easily determine which components of the assessment packages are useful for assessing training of staff elements and subordinate units?
- Is the guidance about where to locate observers and what they should look for clear and comprehensive?
- Are the data collection requirements burdensome to the observers? Are they able to use the information in their AARs with the units/personnel being trained?
- Could the format of the assessment packages be modified to improve their utility?
- Is it feasible to collect the information specified? For example, are there problems with fielding enough observers for certain types of exercises? How can these be minimized?
- Are the data collected likely to be invalidated by the conditions under which exercises are conducted? For example, if the maneuver training areas are too small for doctrinal scenarios, how does that affect the validity of the assessments? Can the commander make 'mental adjustments' for these factors?
- Is the information derived by using the assessment packages sufficient to allow the commander to make informed decisions about the course of his training program? In particular, is there sufficient detail on staff and subordinate unit performance to determine how to remediate their weaknesses prior to task force or brigade exercises?

Field trials in a few home stations would provide sufficient information to conduct a cycle of revisions to the assessment packages to make them more useful to home station commanders. The assessment packages should be tried through one entire training cycle culminating in a rotation to a CTC. This would enable the home station commander(s) to provide information about all aspects of the use of the packages: their use with units of different size and composition, the ease of identifying applicable sections, the practicality of the format, the utility of the data.

D. Field Trials at Simulation Centers

Simulation centers (the premier example of such centers is the SIMNET training facility at Ft. Knox, KY) present another opportunity for valuable feedback about the utility of the CCF Assessment Packages. One of the advantages of simulations is the repeatability of the scenario and conditions of the training. Using the assessment packages to gather information about several units attempting the same scenario and conditions would provide the opportunity to see

if there are aspects of unit performance the assessment packages do not capture well. Furthermore, the scenario and/or conditions may be varied systematically to determine how they influence the information gathered using the assessment packages. In naturalistic settings (e.g. home stations or CTCs) it may be difficult to know whether the shortcomings of the assessment package need to be remediated by capturing more about the scenario and conditions or about the performance of the unit.

Simulation centers at home stations (in some cases smaller SIMNET facilities than that at Ft. Knox; in other cases centers that run computerized battle exercises that can be used to train commanders and staff elements) could provide similar information for the more limited exercises they perform.

Generally, the simulation centers have sufficient observers to provide coverage of the actions on the battlefield. The ability to capture the events and replay them also may permit a smaller corps of observers to capture the desired information. The main questions to be answered by feedback from usage of the assessment packages at simulation centers are:

- Can the commander or simulation center manager easily determine which components of the assessment packages are useful for assessing training of staff elements and subordinate units, and tailor the assessment accordingly?
- Is the guidance about where to locate observers and what they should look for clear, comprehensive, and adaptable to the simulation?
- Could the format of the assessment packages be modified to improve utility?
- Are the data collection requirements burdensome to the observers? Are they able to use the information in their AARs with the units/personnel being trained?
- Are the data collected likely to be invalidated by the deviations from realism peculiar to the simulation? Can the commander or OCs make 'mental adjustments' for these factors?
- Is the information derived by using the assessment packages sufficient to allow the commander to make informed decisions about the course of his training program?

Another advantage of simulation centers is that they can run a full schedule of training exercises from which feedback on the assessment packages can be derived. In home station training units typically do not perform exercises suited for use of the assessment packages nearly as frequently. Thus, feedback data should accumulate more rapidly from the simulation centers.

E. Field Trials at the Combat Training Centers

Like the simulation centers, the CTCs are able to conduct training nearly continuously. Data on the application of the CCF Assessment Packages could accumulate quickly from the

CTCs. These centers are the Army's premier unit training facilities. They are rapidly becoming significant sources of doctrinal review and testbeds for the application of tactics, techniques and procedures to complement doctrine. Feedback from these centers would provide invaluable information about the application of the assessment packages to current practices with respect to scenarios, operations and assessment. Furthermore, the CTCs could be a source of behavioral anchors for the assessments of the outcomes. Or, they could provide a substantive review of such behavioral anchors developed by other Army agencies.

The fact that all of the CTCs except the Battle Command Training Program (BCTP) are 'dirt' CTCs -- i.e. the exercises are conducted using real equipment on doctrinally appropriate terrain -- means that the physical format of the assessment packages may require adaptation to field environments. The OCs at the CTCs should be able to provide considerable insight into ways in which the assessment packages could be modified for field use².

The questions that could be addressed by conducting field trials at these centers are essentially identical to those that might be answered by feedback from simulation center field trials:

- Is the guidance about where to locate observer/controllers and what they should look for clear, comprehensive, and adaptable to the CTC?
- Should the format of the assessment packages be modified, especially to facilitate their use in field environments?
- Are the data collection requirements burdensome to the observer/controllers? Are they able to use the information in their AARs with the units/personnel being trained?
- Are the data collected likely to be invalidated by the deviations from realism peculiar to the CTC? Can the commander or OCs make 'mental adjustments' for these factors?
- Is the information derived by using the assessment packages sufficient to allow the commander to make informed decisions about the status of his units and the strengths and weaknesses of his training program?
- Is the information derived by using the assessment packages suitable for developing long term trends that could be used to fulfill the CTCs' second mission: providing feedback to the Army concerning the impact of changes to doctrine, organization, training, materiel, leadership and soldiers?

² Electronic data gathering instruments, whose utility has been demonstrated at the National Training Center and the Joint Readiness Training Center (Huffman, 1994; Keesling, 1994; and Root, 1994), could be used to expedite the collection and forwarding of the data in all settings.

IV. COLLECTION AND ANALYSIS OF FEEDBACK DATA

The proposed review by the school(s) responsible for the doctrinal aspects of the CCF could be conducted in paper format. Written feedback concerning the appropriateness of the assessment packages to current and future doctrine would be most useful.

The questions outlined in each of the above sections could become the basis for a data collection instrument that would be used to gather the feedback needed for a round of revisions to the assessment packages. It would be most appropriate to pose these questions in interviews to be conducted with the training managers, OCs, and unit commanders and leaders.

At home stations, the interviews could be conducted after specific training exercises (CPX, Company/Team STX and FTX, Task Force STX and FTX, for example). At the simulation centers and the CTCs, the interviews with the OCs could be conducted following the AAR for a mission. Interviews with personnel in the unit being trained probably should be conducted after the rotation is completed.

Analysis of the relationship between the measures of effectiveness and the assessments of outcome performance would be of particular interest. One analysis of interest would be to determine whether the measures of effectiveness and assessments of performance are sensitive to differences among units. The study, Determinants of Effective Unit Performance (Holz, Hiller and McFann, 1994: particularly Section II) found that there were very large differences in the training programs that were conducted at home stations and that these were reflected in performance assessments conducted at the National Training Center. To be useful, the CCF Assessment Packages should show similar sensitivity to unit differences.

A second question of interest would be whether the performance of the outcomes is reliably related to the measures of effectiveness. It might be possible to establish a clear connection between patterns of outcome attainment and quantitative scores on measures of effectiveness. Such relationships could help to focus training programs by indicating which outcomes must be achieved to attain higher measures of effectiveness. Finally, an analysis of the relationship of home station assessments and measures of effectiveness to those obtained on the same units at the CTCs would be interesting as a vehicle for providing feedback about performance expectations to the home stations.

IV. SUMMARY

The CCF Assessment Packages have been prepared to complement a function-oriented training program at home stations. These packages would also be useful for assessing unit performance in simulated combat at the CTCs and other simulation centers. Before they are adopted widely they should be reviewed for doctrinal content (with some attention paid to areas that are in flux and likely to change soon), and for practicality of application in the settings for which they are intended. Field trials in these settings should provide the information needed to improve the utility of these packages.

VI. REFERENCES

- Holz, R. F., Hiller, J. H. and McFann, H. H. (1994) Determinants of Effective Unit Performance, Alexandria, VA: Army Research Institute for the Behavioral and Social Sciences.
- Huffman, J. (1994) Field Tryout of Close Air Support Task Performance Measurement System, Air-Ground Training Feedback System. Monterey, CA: Army Research Institute for the Behavioral and Social Sciences.
- Keesling, J. W. (1994) Quick Turn-Around Analysis Support for Desert Hammer VI: Documentation of On-site Activities During Rotation 94-07. Monterey, CA: Army Research Institute for the Behavioral and Social Sciences.
- Keesling, J. W. and Clifton, T. (1994) Prototype U.S. Army National Guard Armor and Mechanized Infantry Database: Longitudinal Data Collection and Analysis Plan. Boise, Idaho: Army Research Institute for the Behavioral and Social Sciences.
- McIlroy, Bart (1994) Task Analysis for Coordinate, Synchronize and Integrate Fire Support (Critical Combat Function 15). Monterey, CA: US Army Research Institute.
- O'Neal, J. (1994), A proposal for the future of our CTCs. Fort Hood, TX: HQ III Corps and Fort Hood.
- Root, J. (1994) Implementation of Close Air Support Performance Research Database: A Training and Feedback Process to Enhance Joint Close Air Support Operational Readiness. Monterey, CA: Army Research Institute for the Behavioral and Social Sciences.